

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : YOKOHAMA RUBBER CO LTD:THE

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(72)Inventor : KIMURA KAZUTOSHI

YOSHIKAWA ATSUSHI

(54) ROOM TEMPERATURE-SETTING COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a room temperature-setting composition which contains an organic polymer having at least one reactive silicon-containing group as the main component and has a sufficient adhesiveness even to the steel plate coated with an acrylic resin or with a fluororesin by an electrophoretic deposition process, or to the cured product of a sealant such as a silicone sealant.

SOLUTION: This room temperature-setting composition comprises (A) 100 pts. mass of an organic polymer which has at least one silicon-containing group, has a hydroxyl group or a hydrolyzable group bonding to the silicon, and can crosslink by forming a siloxane bond, (B) 1-50 pts. mass of an epoxy resin, (C) 0.1-30 pts. mass of an oxazolidine compound, (D) a silanol condensation catalyst, and (E) an amine promoter.

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CLAIMS

[Claim(2)] [Claim 1A] Organic polymer [00] mass part which has a hydroxyl group or a hydroxyl group combined with a silicon atom, and has at least one silicon content group which can construct a bridge by forming a siloxane bond, (B) A room-temperature-curing nature constituent which can construct one to epoxy resin [50 mass part, the (C) oxazolidine compound 0.1 ~ 30 mass parts, the (D) island of condensation catalyst, and (E) amine system co-catalyst.

[Claim 2F] (1)2-ethylhexanoic acid, (2) The room-temperature-curing nature constituent containing at least one oxazolidine ring breakage accelerator chosen from a group which consists of a mixture or an addition of ORUTOGI acid ester, and (3) ORUTOGI acid ester, and a p-toluenesulfonic acid monoacylate according to claim 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the room-temperature-curing nature constituent
which reveals sufficient adhesive property also to the hardened material or sealant, such as a steel
plate in which acrylic electropainting, fluoride painting, etc. were given, and silicone series sealant, in
more detail about a room-temperature-curing nature constituent.

[0002]

[Description of the Prior Art] The organic polymer which has from the former the hydroxyl group or
hydroxyl basis combined with the silicon atom, and has at least one silicon content group which can
construct a bridge by forming a siloxane bond, it is called the following "reactive silicon group", which can construct a bridge by forming a siloxane
bond, it is known for having the outstanding room-temperature-curing nature, and is used for
adhesive, sealant, etc. especially in an organic polymer in a film of saturated hydrocarbon
system, it is suitably used as a water blocking material and sealant from the outstanding hydrocarbon
weatherability, low moisture permeability, etc. However since said saturated hydrocarbon system
organic polymer is inferior to adhesion manifestation nature, various techniques are examined in
order to improve adhesion manifestation nature. For example, although the formula in which the
formula which makes an epoxy resin contain makes JP-HB-81569A, contain an adhesion agent
against is indicated to JP-HB-41361A, and JP-HB-46748A. Since neither of adhesion
manifestation nature was enough, it was indispensable to have used primer together. However, even
if it used a primer together to the steel plate in which acrylic electropainting, fluoride paint, etc. were
performed, or the hardened material of sealant, especially silicone series sealant, sufficient adhesive
property was not able to be made to reveal.

[0003]

[Problem(s) to be Solved by the Invention] This invention uses as the main ingredients the organo
polymer which is an organic polymer which has a reactive silicon group, which
has at least one reactive silicon group. Let it be SUBJECT to provide the room-temperature-curing
nature constituent which reveals sufficient adhesive property also to the hardened material of
sealant, such as a steel plate in which acrylic electropainting, fluoride paint, etc. were performed, and
silicone series sealant.

[0004]

[Means for Solving the Problem] This invention has a hydroxyl group or a hydroxyl basis combined
with the (A) silicon atom. Organic polymer 100 mass part which has at least one silicon content group
which can construct a bridge by forming a siloxane bond. (B) Provide a room-temperature-curing
nature constituent one to forty 50 mass part, the (C) oxazoline compound 0.1 - 30
mass parts, the (D) silanol condensation catalyst, and (E) amine system co-catalyst.
[0005] It is preferred that at least one oxazoline ring breakage accelerator chosen from a
group which consists of a mixture or an addition of (F) (1,2-ethyleneglycolic acid, (2) ORUTOGI acid
ester, and (3) ORUTOGI acid monosuccinate.

[Embodiment of the Invention] Below, this invention is explained in detail. (A) organo/polymer used
for the room-temperature-curing nature constituent of this invention is a polymer which does not
contain substantially carbon-carbon unsaturated bonds other than an aromatic ring, and it has a
reactive silicon group, i.e., the hydroxyl group combined with the silicon atom, or a hydroxyl basis.

and has at least one silicon content group which can construct a bridge by forming a siloxane bond.
[0007] (A) The polymer used as the skeleton of an organic polymer is obtained by the following
methods. To explain.

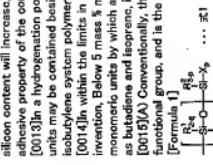
[0008] (1) A way carbon numbers, such as ethylene, propylene, 1-butene, and isobutylene, polymerize
the olefinic compound of 1-6 as a main monomer.

(2) How to hydrogenate after making dieneomers, such as butadiene and isoprene, homopolymerize
or carrying out copolymerization of the above mentioned olefinic compound and the diene series.

[0009] It is preferred that it is the isobutylene system polymer from a point of being able to increase
the number of end functional groups and hydrogenation polymerization which has isobutylene and
copolymers, the olefin of the carbon numbers 4-12 vinyl ether, an aromatic vinyl compound,
to introduce a functional group into an end among these polymers and which are easy to control a
molecular weight.

[0010] (A) such as a copolymer component, for example 1-butene, 2-butene, A-2-methyl-1-butene, a 3-
methyl-1-butene, a pentene-4-methyl-1-pentene, A-hene, a vinylcyclohexene, the methyl vinyl
ether, ethyl vinyl ether, isobutyl vinyl ether, ethylene, propene, isobutene, alpha-methylvinylcyclohexene, the methyl vinyl
ether, vinylcyclohexene, isobutylene, beta-propene, isobutene, vinyl triethylsilane, vinyl methylsilyl
chlorosilane, vinyldimethylchlorosilane, vinyldimethylmethoxysilane, Vinyl trimethylsilane, divinyl
dichlorosilane, Divinyl dimethylsilane, Divinyl dimethylsilane, Gamma-methoxyl oxypropyl
triethoxysilane, Gamma-methoxyl oxypropyl methyl dichlorosilane, etc. as is mentioned.
[0011] (A) a monomer which has isobutylene and copolymer, if vinylsilane and arylsilane are used, a
silicon content will increase, the basis which one acts as a silane coupling agent will increase, and the
adhesive property of the constituent obtained will improve.

[0012] (A) a hydrogenation polybutadiene system polymer or other organic polymers, other monomeric
units may be combined besides the monomeric unit used as the main ingredients like of an
isobutylene system polymer, however, the units in which (A) organic polymer does not deviate from the gift of this
invention, Below 5 mass % may contain [below 10 mass %] still more preferably especially a little
monomeric units by which a double bond remains after a polymerization like polyene compounds, such
as butadiene and isoprene, in the range below 1 mass % preferably.
[0013] (A) Conventionally, the reactive silicon group of an organic polymer is a publicly known
functional group, and is the following formula 1 as the example of representation. [0016]



[0014] (B) the inside of a formula, R_1^1 , R_2^1 , and R_3^1 — each — the alkyl group of the carbon numbers 1-20. The
aryl group of the carbon numbers 6-20, the alkyl group of the carbon numbers 7-20, or $(\text{R}_1^2)^3\text{SiO} -$
(R_2^2) 2 is a univalent hydrocarbon group of the carbon numbers 1-20, and three R_2^2 may be the same
or may differ. When the Toru ORGANIC study group shown is expressed as R_1^2 and two or more R_2^2
exists, it may be the same, or may differ. X expresses a hydroxyl group or a hydroxyl basis when it
exists, and 2, r pieces [0018] it is p+rQ=1, although p is 0, 1, 2, or 3 and q
exists, and 2, r pieces [0018]

[Formula 2]

[0015] (C) the inside of a formula, R_1^3 , R_2^3 , and R_3^3 — each — the alkyl group of the carbon numbers 1-20. The
aryl group of the carbon numbers 6-20, the alkyl group of the carbon numbers 7-20, or $(\text{R}_1^4)^3\text{SiO} -$
(R_2^4) 2 is a univalent hydrocarbon group of the carbon numbers 1-20, and three R_2^4 may be the same
or may differ. When the Toru ORGANIC study group shown is expressed as R_1^4 and two or more R_2^4
exists, it may be the same, or may differ. X expresses a hydroxyl group or a hydroxyl basis when it
exists, and 2, r pieces [0018]

[Formula 2]

[which has an average of one or more epoxy groups in 1 intramolecular]. Average value of an epoxy group of 1 intramolecular refers to a value which broke the sum total of a molecular weight of an epoxy resin by the same ratio of a weight per epoxy equivalent here. Specifically, various isomers of tetrahydroether diaminodiphenylmethane, trihydro(p-anisophenol) a triglycidylaminophenol, and trihydroxy amine orated as a monomerized A bisphenol type epoxy resin which uses amine as a precursor. Phenols as an epoxy resin used as a precursor to a bisphenol A type epoxy resin. Bisphenol F type epoxy resin, a bisphenol smooth S type epoxy resin, phenol novolak type epoxy resin, cresol novolak type epoxy resin, a resorcinol type epoxy resin, etc. are mentioned.

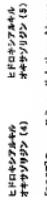
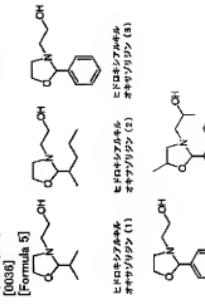
A polyisobutylene modified epoxy resin which uses as a main chain a polyisobutylene skeleton expressed with following formula— $(C_2H_5)_2CHOC_2H_5$ —[in an integer of 1-5 among a formula], is also used suitably. As for an example of this polyisobutylene modified epoxy resin, F-50 by the Tomy Industries (Tokyo) company, Fip 60, and Fip 65 grade are mentioned. In this invention, it is independent about various above-mentioned epoxy resins, or two or more sorts can be mixed and used. Since compatibility and the separability of (A) organic polymer and the (B) epoxy resin participate in superiority or inferiority of adhesion manifestation nature, it is also useful by using together two or more sorts of epoxy resins to adjust both compatibility and separability to a suitable grade, so that it may mention later.

[0031]C content of the (B) epoxy resin in a room-temperature-rolling nature constituent of this invention is 1 - 50 mass part to (A) organic polymer, 100 mass part, and it is preferred that it is 1 - 30 mass part. The physical properties of an organic polymer are not applied as it is this range.

[0034] (C) oxazoline compound used for this invention is a compound which has the heterocyclic of a saturated five-membered ring containing oxygen and nitrogen, and is a compound which has an oxazoline ring, which carries out ring breakage under existence of humidity (water). Specifically, N-hydroxylated oxazoline and its polyisobutylene addition, oxazoline silylether, carbamate oxazoline, ester oxazoline, etc. are mentioned.

[0035]N-hydroxylalkyl oxazoline can be prepared by a dehydrating condensation reaction with alkylamine, ketone, or aldehyde, for example, 1-(*n*-hydroxylalkyl) oxazoline, 2-(*n*-propoxy-1-(*n*-hydroxylalkyl) oxazoline, 2-(*n*-butyloxy-1-(*n*-butyloxy) oxazoline (1) hereafter—*n*-(*n*-methylbutyl)-3-(2-hydroxyethyl) oxazoline, 2(which it lets to be hydroxylated) oxazoline (2) hereafter—*n*-(*n*-hydroxyethyl)-3-(2-hydroxyethyl) oxazoline, 2(which it lets to be hydroxylated) oxazoline (3) hereafter—*n*-(*n*-methylbutyloxy)-3-(2-hydroxyethyl) oxazoline, 2(which it lets to be hydroxylated) oxazoline (4) hereafter—*n*-(*n*-methylbutyloxy)-3-(*n*-hydroxyl) oxazoline (5) etc. are included.

[0036] [Formula 5]



[0037]Oxazoline silylether Above-mentioned N-hydroxylalkyl oxazoline, Trimethoxysilane, a trimethoxysilane, triethoxysilane, is obtained by a reaction with alkoxysilane, such as dimethoxydimethylsilane, vinyltrimethoxysilane, vinyltriethoxysilane, gamma-glycidylpropoxytrimethoxysilane, and

[0019]a which can be boiled and set does not need to be the same, *r* is an integer of 0, or 1-19. The basic show that it is not limited and is conveniently usable in a publicly known hydrolytic basis, especially the hydrolytic basis in the formula 1. Specifically, a hydrogen atom, an alkoxy group, a acetoxy group, a KETOKISHI amine group, an amide group, an amino group, a methoxy group, a sulfhydryl group, an alkenyl group, etc. are mentioned as a substituent. Especially, if it is a methoxy group, the hydrolytic basis and hydroxyl group can be combined with one silicon atom in the 1-3 ranges, and, as for (3-r), can be combined with one silicon atom in the range of 1-5. When a hydroxyl basis and a hydroxyl group join together in 1 or more [a reactive silicon group], they may be the same or may differ. [0021]The number of silicon atoms which form the reactive silicon group may be one, they may be two or more pieces, and are following formulas especially. [0023]

[Formula 3]

$\text{—SiH}_2\text{R}_2^2\text{X}$, X , and p are the same as the above among a formula.]

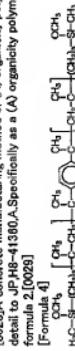
[0024]R², X , and p are the same as the above among a formula.] — the reactive silicon group shown acquisition — since it is easy, it is desirable.

[0025]1-5 reactive silicon groups exist preferably in [at least one, one molecule of an organic polymer. The number of the reactive silicon groups contained in a molecule becomes difficult to reveal an adhesive property in less than one piece.

[0026]The reactive silicon group may exist in 1 then end of the chain of (A) or organic polymer, may exist in the inside, and may exist in both. When especially a reactive silicon group exists in a molecular terminal, since the effective network density of the organic polymer component contained in the hardened material formed eventually increases, it is desirable. These may be used alone and may be used together with more sorts.

[0027]The number average molecular weight of (A) organic polymer is preferred as an isobutylene system polymer, or a hydrogenated polybutylene system polymer is preferred from points — it is desirable still more preferred that it is 500 to about 100000, and it is easy to deal with about 1000 to 30000 thing, which is liquefied or has mobility.

[0028]A concrete method of (A) organic polymer explained above is indicated in detail to JP-H-41580-A. Specifically as a (A) organic polymer explained above, it is the following



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[0029]EPION (made by Kenacorp Corp.) m and n are indicated to be to the integer of 0, or 1-20 and 1

[0030]C_nH_n(C₂H₅)₂₀ is illustrated suitably.

[0031]It can have polyester or polyester which are obtained by the method currently indicated by JP-S1-15618-B as a (A) organic polymer in a main chain, and the modified silicone resin which has a hydrolytic silicon group in a molecular terminal is illustrated suitably. As (A) organic polymer, it commerical MS polymer (made by Kaneske Corp.) is illustrated suitably. It is a polyether polymer, it has a polyester and a polyester group in a main chain, and the silanating polyisobutylene skeleton group of a description, etc. can be illustrated to JP-H-134165-A which introduced the hydroxyl silane group into the OH radical or the sulfhydryl group of the end.

[0032] (B) epoxy resin used for this invention is an epoxy propolymer which is not hardened

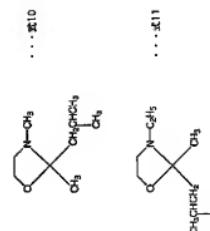
11. オキサソリンリルエーテル合物

オキサソリンシリルエーテル化合物 (6)

$$\text{Si}\left(\text{OC}_2\text{H}_4\text{N}^+\text{CH}_3\right)_3$$

[0076] [Formula 18]

(b) If R_1 and R_2 are branched chains, then the chain shape is branched. For example, shows an allyl group, an alkenyl group, and an alkylene group. R_25 and R_{26} show the hydrocarbon group of a hydrogen atom or the carbon numbers 1–200, respectively. These desirable examples are shown below.



[00080] The content of the (C) oxazolidine compound in the room-temperature-curing nature constituent of this invention is 1 - 10 mass part to (B) epoxy resin 100 mass parts and it is preferred that it is 5 - 40 mass part. Physical properties or hardenability of an organic polymer are not spoiled as it is this range.

[00081] The reason-temperature-curing nature constituent of this invention shows the Reason for excelling in a room-temperature-curing nature constituent of this invention. In the room-temperature-curing nature constituent of this invention, when the (B) epoxy resin which both separated and was mainly separated from the state where (A) organic polymer and (B) epoxy resin are redistributing hardens, an adhesive property is revealed. On the other hand, hydrolysis generates an amino group and a hydroxyl group and the existence of humidity (water), the amino group reacts to the epoxy group which the (B) epoxy resin has, and the (C) oxazolidine compound stiffen the (B) epoxy resin. Although hardening of the (A) organic polymer is not necessarily quick under a room temperature, when the room temperature of (A) organic polymer is taken into consideration, it is a hardenable polymer.

[00082] The balance of the hardens of (A) organic polymer and (B) epoxy resin is mainly balanced. Thus since the balance of the hardens of (A) organic polymer and (B) epoxy resin is balanced, the hardenability under a room temperature of (A) organic polymer and (B) epoxy resin is balanced.



uses by independent [which was mentioned above]

[0091] [Formula 22]  . . . ■ 14
 [0092] As for the content of (F) oxazolidine ring breakage accelerator in the room-temperature-curing nature constituent of this invention, it is preferred that it is 0.1 - 100 mass part to (C) oxazolidine compound (10 mass part), and it is more preferred that it is 1 - 50 mass part. Desirable hardened monomer nature is obtained with it in this range.

(D9381) ingredient, which may be added in addition to the (F) ingredient used for the essential ingredient of this invention and this invention is illustrated below.

(D9384) a bulking agent — fumed silica and calcium carbonates (precipitated calcium carbonate). Heavy oil, carbon black, clay, talc, titanium oxide, quicklime, kaolin, zeolite, acid, or fatty acid ester, carbon black, day salt, diamonaceous earth, PVC/PVC pastes, glass balloons, a vinylidene-chloride resin balloon, an acrylonitrile methacrylonitrile resin balloon, etc. are mentioned, and it is independent, or can be mixed and used.

[0095]A plasticizer is not limited especially if it dissolves with (A) organically polymer with processes oil or other hydrocarbon, and it is plasticizer I_2 usable in various kinds of publicly known plasticizers. For example, dibutyl phthalate, diethyl phthalate, di(2-ethylhexyl) phthalate, Phthalic ester, such as

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butylbenzyl phthalate and butyl phthalyl butyl phthalate; Diethyl adipate, Non-aromatic dibasic acid ester species, such as diethyl sebacate; Diethylene glycol dibenzoate, Ester species of polyethylene glycols, such as triethylene glycol dibenzoate; Tricresyl phosphate, Phosphoric ester [$\text{C}_6\text{H}_5\text{CH}_2\text{OPO}_3(\text{CH}_3)_2$], also known as triethyl phosphate; [1-allyl-1,3-dibutyl-1-hydrocarbonyl] [$\text{C}_6\text{H}_5\text{CH}_2\text{OPO}_3(\text{CH}_3)_2$] — allyl benzenes are mentioned. Especially, using processes using a hydrogenated compatibility [1-allyl-1,3-dibutyl-1-hydrocarbonyl] — processes oil — allylbenzenes are mentioned. Although it may add oil from a compatibility polymer, mainly using an organic polymer ester becomes viscous from for workability, a plasticizer is preferred. As a content of a plasticizer in a room-temperature-curing nature constituent of it is mentioned that it is 10–30 mass part, and it is more preferred that it is 30–50 mass part.

(A) or organocatalytic polymer 100 mass part, and it is more preferred that it is 30–50 mass part.

(B) a hindered phenol system compound and a triazole compound are mentioned. As for a solvent, tetrahydrofuran, carbon black, and red ochre are mentioned, for

[0079] (A) organic polymer whose room-temperature-curing nature constituent of this invention is an essential ingredient, in example (B) it is obtained an epoxy resin, the (C) oxazolidine compound, (D) silanol condensation catalyst, (E) amine system co-catalyst, and it needed by carrying out stirring mixing of (F) onazolidine ring accelerators and the other additive agents.

[0080] (D963A) room-temperature-curing nature constituent of this invention may reveal an outstanding adhesive property to a hardened material of sealant, such as an aluminum plate or not only a glass plate but what is called a difficultly sandable sheet such as which acrylic electrocoating, fluorine paint, etc. were performed, and silicone series sealant. Therefore, it is suitably used as sealant of various building materials in which a hardened material of sealant, such as a steel plate in which acrylic electrocoatings, Fluorine paint, etc. were performed, and silicone sealant, is used.

[0081] (D963B) room-temperature-curing nature constituent of this invention can be made into which mode of two-component type sealant or liquid type sealant. It can be determined in view of a use, description of (D) organic polymer to be used, etc. two-component type or liquid type are any example.

When considering it as two-component type sealant, it is preferred to make the (C) oxazolidine compound hardening the agent side. The room-temperature-curing nature constituent of this invention can also be a primer layer, in the case of use, and a more outstanding adhesive property can be made to realize. Since a thing containing an amino group content silane coupling agent is excellent in adhesion manifestation nature as a primer, it is desirable.

[0102] Although working example is given to below and this invention is explained more concretely two or more sorts.

This invention is not limited to the following working example. Starting mixture of the material shown below in *Generalization of a room-temperature-curing nature (convention)* was carried out using 56 planetary (homogeneous stirrer), by the quantitative ratio used shown in the 1st table and the base resin and the hardening agent of two-component type sealant used as the main ingredients the organic in the room-temperature-curing nature constituent which uses as the main ingredients the organic polymer which has a reactive silicon group were prepared. P-10 oligomer, EPON1050S, the process oil of the 1) Main agent component: #4A) organic polymer, weight 2000, and 33 mass % Content, #B) phenol, bisphenol-A-type epoxy resin B28, al recovery epoxy resin HE105, Tokyo Industries thikol epoxy equivalent: 184-1, 164 Epoxidol, type epoxy resin B28, Tokyo Industries thikol company #2, building materiality, aid processing silicon carbide. Cut fine 200, #2 plasticizer by Nipco Oeleum Oos, Ltd. Proses #3-32 Identus Kean #3 water, (2) diluent #4-10 Agent-component #4C) oxadiazine compound NS-PLUS, the product made by ANGUS, and chemical

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[...]
[...]

[1102]

[103]

実験 条件		実験 結果						
		100 ppm						
(A) 有機質合体 主 要 部	有機質合体	100	100	100	100	100	100	100
	可溶性 有機 物質	100	100	100	100	100	100	100
(B) ピクノメトリカル定容法 主 要 部	ピクノメトリカル定容法	150	150	150	150	150	150	150
	ボルトガル式定容法	5	5	5	5	5	5	5
(C) アミン系触媒 主 要 部	アミン系触媒	6	5	6	5	5	5	5
	オキソトリジン系触媒	0.5	0.5	0.5	0.5	0.5	0.5	0.5
(D) オキソトリジン系触 化 主 要 部	オキソトリジン系触 化	3	3	3	3	3	3	3
	オキソトリジン系触 化	0.2	0.5	0.5	0	0	4	4
(E) フルボ酸エチル 主 要 部	フルボ酸エチル	0	0	0	0	0	0	0
	フルボ酸エチル p-ブロムジン酸エチル	0	0	0	0	0	0.2	0.2
(F) 2-エチルヘキサデ 主 要 部	2-エチルヘキサデ ン	0	0	0	0	0	1	1
	2-エチルヘキサデ ンp-ブロムジン酸エチル	0	0	0	0	0	0	0

[0104] Stirring mixing of the material shown below in <preparation of a primer composition> was carried out by the quantitative ratio shown in the 2nd table, and the primer compositions A and B

mass % is contained. [0]03]

	プライマー-A	プライマー-B
ルーベンソン	9.0	9.0
トルエン	1.0	1.0
酢酸エチル	0.0	1.0
シリコーン油	2	1
アセト酸ナトリウム	7	7
酢酸鉄	4	2.5

[1010G]Adhesive examination: The outdried primer composition A or B was applied to the surface of plastic-like adherend by BEICO-T. As a substrate, an aluminum plate, the glass plate, the acrylic plate, the anodized steel plate, the fluoride coated steel sheet, and the silicon sheet, on these materials were used. After applying each primer composition to substrate on these adherends and air-drying it for 60 minutes, each room-temperature-curing thermosetting constituent was

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placed about 1 cm in diameter in the shape of a bead, and cured at 50 °C for three days and for three days was performed. Then, it is based on the simple adhesive property examination (Japanese sealing material industry structural sealing material handbook p.109) by knife cutting, and is friction test ***** (a 0-degree friction test and a 90-degree friction test) about a 0 degree direction and a 90-degree direction, a tensile direction, and a tensile direction, and the adhesive property was evaluated like Osealant destruction, within layer exfoliation, and interface exfoliation. [0171A] The result is shown in the 3rd table. The room-temperature-curing nature constituent (working example 1 and 2) of this invention reveals the outstanding adhesive property, also to which adherend or glass, an acrylic electrocoating seal plate, a fluorine coated steel sheet, and a silicone series sealant hardened material so that clearly in the 3rd table. When using the prime (prime) B) inferior to adhesion manifestation nature, the outstanding adhesive property can be made to reveal by adding (F) exoxidine ring breakage accelerator further, or choosing the substrate (C) oxazolidine compound. On the other hand, the conventional room-temperature-curing nature constituent, (comparative example 1) which contains the (A) organic polymer and the (B) epoxy resin, and does not contain the (C) oxazolidine compound does not reveal sufficient adhesive property.

[Table 3]

耐溶性化粧板物	耐溶性化粧板						
	1	2	3	4	5	6	7
フライヤー板物	A	A	A	B	B	B	B
は < 開く式 (90° はね物 / 0° はく離)	O/x	O/△	O/x	O/△	O/△	O/x	O/x
アルミニウム板	O/x	O/△	O/x	O/x	O/x	O/△	O/○
ガラス板	O/x	O/△	O/x	O/x	O/x	O/△	O/○
アクリル電着板	△/x	O/△	O/○	△/x	△/x	△/x	O/△
フッ素樹脂板	△/x	O/△	O/x	△/x	△/x	△/x	O/○
シリコーンシーラント硬化物	-	-	x/x	△/x	△/x	△/x	△/x

[0169] [Effect of the Invention] The room-temperature-curing nature constituent of this invention reveals sufficient adhesive property also to the hardened material of sealant, such as a difficult adhesive property steel plate in which acrylic electrocoating, fluoride paint, etc. were performed, and silicone series sealant.

[Translation done.]